

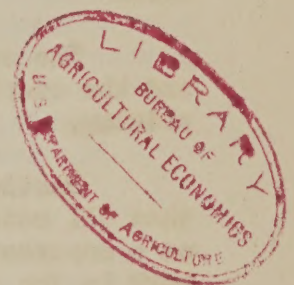
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL ADJUSTMENT ADMINISTRATION
NORTH CENTRAL DIVISION

PROCEDURE FOR HANDLING WORK IN THE
STATE OFFICE IN CONNECTION WITH THE
1939 AERIAL MAPPING PROGRAM

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UNITED STATES DEPARTMENT OF AGRICULTURE
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PART I - GENERAL

It will be the function of the performance and aerial mapping section in the State office, under the direction of the State committee, to handle the work in connection with the aerial photographic survey of the North Central Region and to coordinate the survey with the checking of performance and other phases of the Agricultural Adjustment Administration programs. This procedure outlines some of the technical requirements of this work and contains instructions covering the preparation of the "AP" forms which will be used in connection with the aerial mapping program.

This outline has been prepared for the instruction and guidance of those working on the aerial photographic survey. It covers the normal order of flying an area, receiving and inspecting materials delivered by the contractor, and the work incidental to, and including, ordering, checking, and preparing enlargements for use in determining performance.

In order to establish uniform use throughout the North Central Region of the terms "length" and "width" as applied to aerial negatives, contact prints, and enlargements, the length will be regarded as that distance measured parallel to the line of flight, and the width as that distance measured perpendicular to the line of flight. For example, the 7-inch dimension of a 7" x 9" aerial negative is the length, and the 9-inch dimension of a 7" x 9" aerial negative is the width. The same rule will govern the use of the terms "length" and "width" of a 9" x 9" negative.

The overlap along the line of flight will be known as endlap, and the overlap at right angles to the line of flight will be known as sidelap.

Particular care will be exercised by the State committee to insure that all materials delivered and the evidenced technique of performance on a contract with an aerial survey company are such that the photographic work in the air and in the laboratory is of sufficiently high standard to assure full and complete compliance with the requirements of the specifications.

The State committee will instruct and frequently check the work of the performance and aerial mapping section. The scale of all contact prints, the enlargement ratios, and the orders for enlargements will be rigidly checked.

The specifications as approved by the Secretary of the Treasury May 27, 1937, with deviations authorized by the Director of Procurement for the Department of Agriculture, will be used in connection with the

1939 aerial photographic survey. The attention of the State committee is directed to the stipulations set forth in the Invitation, Bid and Acceptance and in the Continuation Schedule. These stipulations are a part of the contract with the aerial survey company, and every effort will be made to insure thorough compliance with them as well as with the specifications.

PART II - MAPS

A sufficient number of maps of each county to be aeri-ally photo-graphed will be secured to provide the performance and aerial mapping section and the North Central Division with maps as required and to provide for the disposal of maps as required by this Part II.

Maps showing streams, roads, railroads, section boundaries, section numbers, ranges and tiers, township boundaries, and township names are desired. Such maps should be printed on a good grade of paper. A complete set of all available topographic sheets for the area to be flown will be secured. Authorization for the purchase of topographic sheets, etc., will be secured from the North Central Division, Washington, D. C., prior to any agreements with local agencies. A study of the relief of an area as represented by contours shown on the topographic sheets will prove valuable when determining contact print scales.

If it develops that the cost of obtaining the necessary number of maps is prohibitive, one map of each county may be secured and duplicated.

The State office will prepare five flightline maps of each county. Four will be retained in the files of the performance and aerial mapping section, and one will be forwarded to the North Central Division, which, after acceptance, will be the official flightline map. The State office will be informed of the acceptance of these maps and of any changes made by the North Central Division. Such changes will then be incorporated in the four maps retained in the files, and three of these maps for each county delivered to the contractor. After the flightline map has been forwarded to the North Central Division, no changes will be made in flightline maps without authorization from the Washington office.

Three maps of each county will be used for preparing county enlargement index maps. Immediately after preparation of these maps one map will be forwarded to the North Central Division. One map will be retained in the files of the performance and aerial mapping section, and one map will be forwarded to the chairman of the county agricultural conservation committee with the enlargements for the county.

Where feasible, the first flightline of a county subproject will be placed on a section line approximately one mile inside the county subproject boundary. Under USDA 5053 the contractor will not be required to include contact prints with the contact prints for a county, for flightstrips resulting from photography along flightlines approximately one mile inside the boundaries of the adjacent counties, except when such adjacent

county is flown in a different direction, or when a boundary of a county is also a part of the item boundary. Care will be taken to determine that there is sufficient overlap beyond a county boundary line to give reasonable assurance that when the adjacent county is photographed there will exist sufficient sidelap between the last flightstrip of one county and the first flightstrip of the adjacent county. However, after the necessary materials are received a thorough check will be made to determine that the required sidelap exists between prints in the first and last flightstrips of a county onto the prints of the immediately adjacent flightstrips of the adjoining counties.

Immediately after the North Central Division has approved the county flightline maps as to position of the flightlines and flightline numbers, the flightlines will be plotted and numbered on a map of the area showing county boundaries. This map will be forwarded to the North Central Division. Designating symbols for flightlines and portions of flightlines will be entered on the map and reproductions made therefrom. Copies of this map will be forwarded to the State office and to the contractor. The contractor will follow such map when placing designating symbols on aerial negatives, and the copy forwarded to the State office will be used in checking designating symbols shown on contact prints and photo index maps.

PART III - INSPECTION OF CONTACT PRINTS AND USE OF FORM AP-3 (REVISED APRIL 26, 1939)

When the contact prints are received they will be laid out in flightlines and, with the aid of the AP-6, the photo index map, and the rough index map, checked for completeness of shipment and specification requirements. Special care will be taken to determine that the proper serial number and designating symbols appear on each contact print. At this time appropriate entries will be made on Form AP-3 for each contact print necessary for coverage of the county.

Forms AP-3 will be prepared as follows:

Enter in the appropriate spaces the name of the State, the identification number and USDA number, the sheet number, the flightline number, the date on which, and the name of the agency from which, the contact prints were received, the name of the county covered, and the number and size of the contact prints received. The first identification number for a shipment of contact prints under a USDA contract will be number 1 (example: 1 USDA 5053), and a consecutive number will be assigned to each shipment of contact prints received thereafter. In the event contact prints for more than one county are received in a shipment, they will not be listed under the same identification number. Contact prints for one county received on different dates will not be listed under the same identification number.

When contact prints are received for reflights or reprints, strike out the word not applicable and enter the date on which they are received,

the sheet numbers, and the identification number of the original recordation and inspection, as well as the data required by the preceding paragraph. Provided the contact prints are the result of the second or third, etc., reflight request, the identification number referred to will be the most recent one.

Enter in the appropriate columns the designating symbol, the roll number, the serial numbers of the contact prints, and the flightline numbers. The data for one flightline only will appear on any one sheet. The completed Forms AP-3 for a county will be assembled by a numerical arrangement of flightline numbers.

Entries of serial numbers of contact prints for each flightstrip will start with the serial number of that contact print at one extreme end of the flightstrip. The starting direction for listing the flightlines is optional but will be consistent throughout each item. Immediately above the first contact print entry for each flight enter "Start South", or other applicable direction.

Enter the words "County boundary" in the same line with the number of that contact print near the end of a flightline on which the county boundary, whether it be the north, south, east, or west boundary of the county, appears outside and nearest the center.

At breaks in a flightline enter the word "break" between the proper contact print numbers.

Immediately below the entry of the serial number of the last contact print in each flightline, enter "End North", or other applicable direction.

The following will govern the entries to be made for each contact print under the proper column headings:

- (1) The degree of crab will be entered for each print crabbed in excess of three degrees, and no entry will be made for prints crabbed less than three degrees.
- (2) Endlap will be entered for each contact print. Such endlap will be measured from the point of least endlap.
- (3) Sidolap entries determined by measurements from the points of least sidolap between prints whose centers are most nearly opposite each other will be made for each contact print. This will necessitate entries being made for sidolap of the prints in the first and last flightstrips of a county onto the prints of the immediately adjacent flightstrips of the adjoining counties. In case an adjoining county is not photographed, enter the percent of overlap beyond the county line.

- (4) The letter "T" will be entered for prints tilted from two degrees to five degrees, and the letters "ET" will be entered for prints tilted in excess of five degrees. No entry will be made for prints tilted less than two degrees.
- (5) Under "Photographic Quality" will be entered defects which are not permitted by the specifications. The areas of any contact print found to be defective should be properly described. This may be accomplished by placing over the print a piece of celluloid having ruled lines that divide the area into four equal quadrants. The quadrant containing the contact print number will be number 1, the date will be in quadrant 2, quadrant 3 will be below quadrant 2, and quadrant 4 will be directly below quadrant 1. In other words, the quadrant numbering will be in a counter-clockwise direction from the print serial number. Entries will read "4 blur", "2 scratch", etc.

Any additional information necessary for a complete understanding of the contact print inspection should be placed on a separate sheet or sheets which should appear as the last sheets of the completed AP-3.

Contact prints should possess all qualities conducive to rapid and accurate interpretation. If erroneous information is obtained due to poor photographic technique, an important function of the aerial survey will be lost.

If a defect may be rectified by the operation of reprinting, the notation "Reprint" will be entered under the last column to the right of Form AP-3 and opposite the contact print number. Upon delivery of the contact prints resulting from reprinting, they will receive the same attention as contact prints included in an original shipment. This will continue until satisfactory contact prints giving complete coverage are on file for each county flown.

If a contact print is missing from a shipment, the word "missing" will be entered.

If a defect cannot be corrected by reprinting, an "X" will be placed in the last column, opposite the number of the contact print at fault, and a reflight will be ordered.

Immediately after inspection of all contact prints required by the Specifications for complete coverage of a county, Form AP-3 will be prepared in triplicate. The original and one copy will be forwarded to the North Central Division, and one copy will be retained in the State office. In the event of a reflight or order for reprints the resulting contact prints will be inspected and the required AP-3's filled out and

mailed. The first and last pages of the original and the copies of AP-3 will be dated and signed by a member of the State committee. The date preceding the signature and title will be the date the AP-3 is mailed to the North Central Division.

PART IV - INSPECTION OF PHOTO INDEX MAPS

Before recommending acceptance of a photo index map for a county subproject it will be carefully checked to determine whether:

- (1) The contact prints used in the assembly correspond to the contact prints forwarded to the State office as to area coverage, designating symbols, and roll and serial numbers. Before comparing the State office set of contact prints with the photo index map, care must be taken to determine whether the indexing on such prints is complete and correct.
- (2) All of the contact prints necessary for coverage within the county and at the ends of the flightstrips are shown on the map.
- (3) The boundaries of the county subprojects are shown correctly.
- (4) There are unnecessary shadows or halation showing on the map.
- (5) The map is of uniform and good photographic quality.

PART V - USE OF FORMS AP-4 (REVISED JUNE 1, 1939)

All orders for reflights, reprints and missing prints, and orders for remaking or reprinting photo index maps will be prepared on Forms AP-4, Aerial Survey Reflight or Reprint Request. Such orders on Forms AP-4 will be prepared in quadruplicate. The original and two copies will be forwarded to the North Central Division, Washington, D. C., and one copy will be retained in the State office. Forms AP-4 will be prepared immediately after the completion of inspection of materials, and the original and all copies will be dated and initialed by a member of the State committee.

When preparing Forms AP-4 for the purpose of requesting reflights, enter the name and address of the contractor, the print recording and inspection identification number, the numbers of the print recording and inspection sheets on which are listed the contact prints covering the areas to be reflighted, the date the contact prints were received, and the size of the negatives from which the contact prints were prepared, the names of the State and county, and strike lines (1) and (2). Immediately below line (3) enter the following for each flightline, or

portion of a flightline, to be reflight: the flightline number, the designating symbols, roll numbers, and exposure numbers as shown on the contact prints covering the areas to be reflight. Immediately under the data for each flightline enter the reason for requesting the reflight. Reflights will not be made between existing flightlines.

When preparing Forms AP-4 for the purpose of ordering reprints (including missing prints) from aerial negatives, enter the data in the heading of the form as instructed in the paragraph on requests for re-flights. Strike lines (1) and (3) and immediately under such lines enter the following for each flightstrip, or portion of flightstrip, for which reprints are to be prepared: the flightline number, the designating symbols, roll numbers, and exposure numbers as shown on the contact prints. This information can be obtained from the photographic-type index map for missing prints. Immediately under the data for each flightline enter the reasons for requesting the reprints. Immediately below the data for all flightstrips enter the following: "One contact print, Positype or equal, to be prepared from each negative and forwarded to" (give name and address of State chairman).

When ordering reprints from existing photo index map negatives, or when ordering a new photo index map covering the same assembly of contact prints but with adjustments in subproject boundary lines, for photographic quality, or for other reasons, enter the name and address of the contractor, the name of the county, and the name of the State. Strike the words "Date Contact Prints Were" and enter immediately above such words "Photo index map" and the date the photo index map was received. Make no entries in the other lines. Strike out the word "remade or "re-printed", whichever is not applicable, in line (1). Strike lines (2) and (3) and enter immediately below line (3) the reasons for requesting a "remake" or a "reprint" of the photo index map. Immediately below the reasons enter the following: "One copy of the sheet(s) to be forwarded to" (give name and address of the State chairman).

PART VI- INFORMATION PERTAINING TO COMPLETION OF AERIAL PHOTOGRAPHY FOR A COUNTY SUBPROJECT

The memoranda covering "Completion of Flying and Inspection of Contact Prints" and "The Completion and Inspection of Photo Index Maps" for each county subproject under USDA 1914 and USDA 3100 (Wisconsin) will be prepared as outlined on pages 11 and 12 of NCR-State 204, issued June 22, 1938.

The following information in memorandum form will be forwarded to the North Central Division immediately after all contact prints, rough index maps, and photo index maps for a county subproject under USDA 5053 have been inspected and found to conform to the specifications and schedule:

"MEMORANDUM FOR MR. CLAUDE R. WICKARD,
Director,
North Central Division.

Re: Completion of Flying and Inspection
of Contact Prints and Photo Index Maps
for _____ County Subproject.

"We are transmitting the following information pertaining to the completion of aerial photography for _____ County subproject, State of _____, flown by _____, USDA 5053.

- "(1) Date original flying completed (includes reflights made at the discretion of the contractor) _____, 1939.
- (2) Date(s) of receipt of the shipment(s) of contact prints, rough index maps, and photo index maps _____, 1939.
- (3) Date inspection of contact prints, rough index maps, and photo index maps was completed _____, 1939."

In the event of a reflight(s) the following additional information will be needed:

- "(4) Date(s) reflight(s) ordered _____, 1939.
- (5) Date(s) reflight(s) completed _____, 1939.
- (6) Date(s) of receipt of contact prints, rough index map(s), and photo index map(s) resulting from a reflight(s) _____, 1939.
- (7) Date inspection of contact prints, rough index maps, and photo index map resulting from the last reflight was completed _____, 1939.

"Contact prints, with the exception of reprints and missing prints, rough index maps, and the photo index map covering this county subproject have been inspected by our office and found to conform with the Specifications and Schedule governing photography under USDA 5053."

This memorandum will be prepared in triplicate. The original and one copy will be forwarded to the North Central Division, and one copy will be retained in the State office. Any other pertinent facts concerning the dates of completion and the quality of material submitted also will be set forth in this memorandum.

Public Vouchers for Purchases, and Services Other than Personal

will be prepared by the contractors upon the completion of aerial photography for county subprojects and forwarded to the North Central Division, Washington, D. C. Since vouchers cannot be forwarded for payment until all materials resulting from aerial photography have been accepted, the contact prints and index maps will be inspected as soon as possible after they have been received in the State office.

We have been informed by the Administrative Audit Section that if sufficient delay occurs in our office or in any field office to prevent the receipt of the discount provided by the contractor, a full explanation of the necessity for such delay will be required. If such delay cannot be satisfactorily explained, it may be necessary to deduct the sum of the resultant loss from any amounts due the officer responsible for such delay.

Inspection of materials submitted by the contractor will be given preference over other work in the aerial mapping section, and forms giving the result of these inspections will be mailed promptly in order that the discounts offered may be secured. These forms may be sent by air mail if necessary.

PART VII - CONTACT PRINT ORIENTATION AND COUNTY ENLARGEMENT INDEX MAP

All markings on the contact prints should be made for the purpose of assisting in identification. Enter the names of the counties, townships, and town in appropriate places. Enter the section numbers in the center of the sections and where advisable enter the tier and range numbers on the edge of the print. At certain times it will be advantageous to mark properly only the contact prints that will be needed for control purposes. At a later date the remainder of the contact prints will be properly marked. The markings on the prints will be transferred to the enlargements before the enlargements are delivered to the counties. If desirable, additional entries such as names of rivers, lakes, and railroads may be made on the contact prints but will not be transferred to the enlargements.

The contact prints giving the best county coverage should be selected for enlarging. Where possible, every other print in a flight-line will be enlarged, carefully avoiding any tilted prints. It may be desirable to place an "E" on the contact prints selected for enlarging to assist the State office personnel in making up Form AP-5.

On a sectionized map of the county, which will be called the county enlargement index map, enter the roll number, the serial number, and, where necessary, the symbol of the contact print selected for enlarging which best covers each section. If two enlargements are required to cover a section, a line will be drawn through the section in the appropriate place and entries made to show the coverage by each enlargement.

Three county enlargement index maps will be prepared. One will

be retained in the State office, one will be forwarded to the North Central Division, Washington, D. C., and one to the county office with delivery of the enlargements. The Ozalid process may be employed for making the additional maps if legible reproductions are obtainable. If it is necessary to make corrections on an index map, a memorandum setting forth the required changes will be prepared and copies forwarded to the county office and to the North Central Division, Washington, D. C.

PART VIII - GROUND CONTROL

The term "ground control" as used in the aerial photographic survey for the North Central Region refers to the horizontal measured distance between any two or more stations on the ground which can be identified on a contact print. These measurements are used for determining the scale of contact prints. The dimensions between collimating marks on the contact print on which control has been secured should be scaled at the same time the distances between control stations are scaled. The scale of the contact print will govern the projection ratio. The scale of the enlargements will be 1" equals 660 feet, unless authorized otherwise by the North Central Division.

Ground control in comparatively level or rolling country will be secured on contact prints in such a manner as to give direct ground control measurements on approximately every fifth contact print. Measurements will be secured by steel tape or chain. They will be rounded to the nearest foot and will show horizontal distances. Ground control in rough counties, or that portion of a county classified as rough, will be secured where practicable on all contact prints for which enlargements are to be made. Control measurements will be made at the beginning and ending of all flightstrips and at all breaks within a flightstrip. These measurements will be made in keeping with accepted engineering methods for obtaining horizontal distances over rough terrain.

At least one measurement on the contact print of approximately one mile or more in length is necessary for enlargement ratio determination. If possible, this measurement will be perpendicular to the line of flight and should be balanced on the contact print in reference to its X and Y axes.

Intermediate stations (pluses along the line of control) will be described in order to show up apparent field errors. These intermediate points will aid in determining the presence and degree of tilt.

As soon as contact prints are selected and properly marked for use in obtaining ground control, they will be forwarded to the county office.

Stereoscopic inspection of contact prints will be found advantageous in selecting the best possible ground control stations of a permanent nature. The stations selected will be indicated by a circle,

triangle, or other positive means of identification. Each station will be lettered or numbered. All stations on contact prints should be as readily and easily located as possible. Letters and numbers for indicating stations will be written legibly but not permanently on the contact prints, as it may be necessary for the taping party to make some changes in the selected stations. In final form, all the markings on contact prints will be made in such a manner as to be of a permanent nature.

All measuring in a county will be under the supervision of an engineer from the State office, using personnel from the county. Sufficient personal instructions will be given by the engineer to these crews to insure that control will be secured rapidly and accurately. Travel will be allowed to the chief of each ground control party. A record of the cost of obtaining ground control will be maintained by the county office. The measured distance, in feet, between the control stations selected will be written on the front or back of the contact print. Designate with the appropriate number or letter all stations between which measurements have been obtained. An accurate and brief description of each station will be written on the back of the appropriate contact print. In addition, a complete record of station description will be kept for ground control in each county. This double entry is intended to assist in checking station descriptions.

An accurate record of all contact prints sent to a county office will be maintained.

PART IX - USE OF FORM AP-5
(REVISED JUNE 1, 1939)

Form AP-5 (Revised June 1, 1939) will be prepared as follows:

Data for only one flightline will appear on any one sheet.

In the appropriate spaces enter the names of the State and county, the flightline number, the designating symbol, and the enlargement factors. Factors for width and length will be computed by dividing the average width and the average length of the controlled contact prints by 6.6 (where enlargements are to carry a scale of 660 feet to the inch). Width and length factors will be carried to five decimal places.

The date the AP-5 is computed, the name of the computer, the name of the person checking the AP-5, and the sheet numbers will be entered in the spaces provided.

Enter in column (1) the roll and serial number of each contact print for the county.

Enter an "E" in column (2) for each print to be enlarged.

Enter in column (3) the contact print scale (column 10 or 11) and

move the decimal point two places to the left. The resulting figure will be that to which 6.6 inches will be enlarged.

Multiply the figure in column (3) by the width and length factors and enter the results in columns (4) and (5), respectively. All enlargement dimensions will be rounded to the nearest hundredth of an inch. These entries will be made for all contact prints.

Enter in column (6) the type of control used, such as "U.S.G.S.", "highway" "taping", etc.

Enter in column (7) the control points, such as "a to b", "c to d", etc., between which the control was applied, as marked on the contact print.

Enter in column (8) the distance in feet between control points.

Enter in column (9) the scaled distance in inches on the contact print between control points. This scaling will be to the nearest .005 of an inch.

Enter in column (10) the control scale which is obtained by dividing column (8) (measured distance in feet) by column (9) (scaled distance on the contact print in inches).

Enter in column (11) the adjusted scale. This entry will be made when necessitated by topography or when the scale has been determined by reference to an assumed datum.

Enter in columns (12) and (13) the contact print width and length. These measurements will be made when the control points (column (9)) are scaled.

In some instances it will be impossible or undesirable to secure control on the contact print for which an enlargement is to be made. In such cases the contact print scale will be determined by interpolation or by other acceptable methods.

The space between lines on Form AP-5 is wide enough to permit data relating to three controls to be entered for one contact print serial number. In order to conserve the number of forms used, disregard such spacing when a series of prints has but one control.

Form AP-5 will be executed in triplicate. The first and last sheets of the original and two copies will be signed by a member of the State committee. His title and the date will be entered in the appropriate spaces.

The original will be forwarded to the North Central Division, one copy forwarded to the county office, and one copy retained in the State office.

PART X -- USE OF FORM AP-1
(REVISED JUNE 1, 1939)

Form AP-1, Order for Enlargements, is designed to accommodate entries in columns (1) to (8) and (9) to (16). The first entries will be made on the left-hand side of the page under the column headings and other entries continued to the bottom of the page. The continuation of these entries will be made on the right-hand side of the page.

Form AP-1 will be prepared in quadruplicate for all enlargement orders. The original and two copies will be forwarded to the North Central Division, and one copy retained in the State office. The first sheet of the original and the first sheet of each copy will be signed by a member of the State committee. The date preceding the signature and title will be the date the enlargement order is mailed to the North Central Division. One copy containing any necessary corrections or laboratory notations will be returned to the State office. The initials and check marks of persons reviewing an enlargement order will be placed on the copy retained in the State office.

Orders will state the final dimensions for enlargements between collimation marks or brackets. Contact print measurements necessary for enlargement dimension calculations will be made from center of bracket line to center of bracket line (between brackets not displaying the direction arrow) in the case of bracketed prints, and from collimation base (immediately below the wing point of the half-arrow head) to collimation base in the case of collimated prints. Entries on all orders for enlargements and on all tolerance check reports will be made in accordance with the definition for length and width of aerial negatives.

Enlargement orders, regardless of their classification, will be numbered consecutively beginning with the number following the last enlargement order number.

An order for enlargements giving initial or supplementary coverage of a county will be known as an original order. An order for enlargements necessitated by reason of poor photographic quality or because of tolerance requirements will be classified as a reorder.

The following information will be entered in the blank spaces on Form AP-1:

- (1) Stamp or type the State and county code numbers in the upper right-hand corner.
- (2) Record the order number and state whether it is an original or reorder.
- (3) State the year and for what purpose the enlargements are to be used.

- (4) Give the sheet number of the order, such as 1 of 8, 2 of 8, or 3 of 8.
- (5) Enter the date the order is typed.
- (6) Enter the names of the State and county, the designating symbol, and the date the order is typed.
- (7) Record the name and address of the contractor.
- (8) State the year flown, the scale, and the agency for which flown.
- (9) Give the size of the master glass negative and strike out the print markings not applicable.
- (10) Enter the average size of the controlled contact prints and the flightline direction.
- (11) Factors for width and length will be computed by dividing the average width and the average length of the controlled contact prints by 6.6 (where enlargements are to carry a scale of 660 feet to the inch). Width and length factors will be carried to five decimal places.
- (12) After the words "computed by" will be placed the initials of the person(s) that made the measurements on the controlled contact prints and computed the width and length factors and enlargement dimensions.
- (13) Enter the number of enlargements ordered and the number of negatives from which the enlargements are ordered.
- (14) After the word "Remarks" will be placed any pertinent information concerning the order such as the camera or magazine number and a diagram showing points of scaling.
- (15) The initials of the person checking an order before submission for signature by a member of the State committee will be entered in the space provided.
- (16) Do not use the space reserved for the "Aerial Photographic Laboratory Data".
- (17) In column (1) enter each designating symbol found on the contact print.
- (18) Enter the roll numbers in numerical order in column (2).

Exception: Should it be necessary to have enlargements prepared from negatives in two rolls, each of which has the same roll number but different in designating symbol, the entries for the negatives in the roll having a designating symbol not assigned to the county for which the enlargements are being ordered will be placed at the end of the order for enlargements.

- (19) Enter in numerical order the negative number (contact print number) in column (3). If more than one enlargement is ordered from any negative, enter the total number desired between columns (2) and (3). This entry will be made with a blue pencil and encircled. Do not use the columns between (3) and (4) and between (11) and (12). These columns are reserved for laboratory check marks.
- (20) Enter in column (4) the value to which 6.6" will be enlarged.
- (21) Multiply all figures in column (4) or (12), as the case may be, by the width and length factors and enter the results in columns (5) and (6), or (13) and (14), respectively. All enlargement dimensions will be rounded to the nearest hundredth of an inch.

In rounding numbers to two decimal places for enlargement dimensions, fractions amounting to five thousandths (0.005) or less will be dropped. All fractions in excess of five thousandths (0.005) will be considered as a hundredth of a unit.

For example: $18.8750000 = 18.87$

$18.8850000 = 18.88$

$18.8750001 = 18.88$

$18.8760000 = 18.88$

$18.8449268 = 18.84$

A. Receiving Enlargements and Checking for Tolerance.

Enlargements received in the State office will be checked as follows:

- (1) Check enlargement against the Form AP-1 retained in the State office and also against Form AP-6 or Form AAA-387, whichever is included with the shipment. When checking the enlargements against the AP-1 enter

the laboratory tolerance figures appearing on the margins of the enlargements in column (7) or (15) as the case may be, directly opposite the ordered dimensions. Record any shortages or errors on Form AP-6 or Form AAA-387 and reorder missing enlargements.

(2) Inspect each enlargement for photographic quality, and reorder enlargements on which lack of photographic quality will seriously retard the speed or accuracy of the planimeter operators, or which will require excessive measurements in the field because of lack of detail. In case an enlargement is rejected for photographic quality, enter in red in column (7) or (15) the letters PQ and in column (8) or (16) the letter R. It will not be necessary to make tolerance checks on such enlargements.

(3) Check for tolerance and reject and reorder enlargements that do not meet the specified tolerance.

The check for tolerance should be made within 48 hours after the enlargements are received in the State office. Then, as soon as possible, the necessary information will be entered on all enlargements accepted, and they will be forwarded to the county office.

To check the enlargements for tolerance, scale the width and length dimensions of each enlargement and enter such scalings above the entries appearing in columns (5) and (6) or columns (13) and (14) on the copy of Form AP-1 retained in the State office.

Only collimating marks will be used for scalings when both collimating marks and brackets appear on an enlargement.

When enlargements display only the corner bracket marks, scalings will be made between brackets which do not display the arrow.

When an enlargement displays etched marks 6.6 inches apart, the length and width will be established as explained in Part I.

After the width and length scalings have been entered on Form AP-1 subtractions will be made to determine width and length tolerance. Where the dimensions are greater than the dimensions ordered, tolerances will be preceded by a plus sign (+), and where less, they will be preceded by a minus sign (-). Tolerance figures will then be multiplied by 100 and entered in columns (7) and (8) or in columns (15) and (16). For example, the tolerance figures $+12$, $-.07$, and $+04$ would be entered as $+12$, -7 , and $+4$, respectively. In cases where the scaled dimensions are the same as the ordered dimensions, a zero (0) will be entered.

To determine whether the enlargement meets the tolerance requirements the width and length dimensions ordered will be considered in the following manner:

Drop any figure to the right of the decimal in the width and length figures ordered, provided such figures are .50 or less. Round to the next inch provided the figures to the right of the decimal are .51 or more.

For example, if the width and length ordered are 22.51 inches and 17.50 inches, such width and length figures will be rounded to 23.00 inches and 17.00 inches, respectively. An enlargement will be considered in tolerance if the algebraic sum of the width and length tolerances is equal to, or less than, one percent of the average of the rounded width and length dimensions ordered. For example, let us assume the width and length dimensions ordered for an enlargement are 21.39 inches and 17.01 inches, and that the scaled width and length dimensions for the enlargement are 21.85 inches and 17.05 inches, respectively. In this case the width and length tolerances would be $-.14$ of an inch and $+.04$ of an inch, respectively, and the algebraic sum of the tolerances would be $-.10$ of an inch. The width and length dimensions ordered would be rounded to 22.00 inches and 17.00 inches, respectively, and the average of such figures would be 19.50 inches. Now, one percent of 19.50 equals $.195$; therefore, the enlargements considered in the above example would be within the tolerance requirements, since the algebraic sum of the width and length tolerances ($-.10$ of an inch) does not exceed one percent of the average of the rounded width and length dimensions ordered ($.19$ of an inch). It will be noted that when one percent of the average of the rounded dimensions ordered results in three figures to the right of the decimal, the third figure will be dropped.

If the scalings for an enlargement entered in columns (7) and (8) or (15) and (16) show that the allowable tolerance has been exceeded, place a red R immediately following the entry in columns (8) and (16).

B. Tolerance Check Reports.

Temperature and relative humidity readings will be taken each day at 8:00 a. m., 12:00 noon, and 5:00 p. m., in the room in which the enlargements are stored. A record of each day's readings will be on file in the performance and aerial mapping section of the State office.

Tolerance check reports will be prepared using the carbon copies of the orders for enlargements returned from the North Central Division. Such reports will be prepared as soon as possible but without interruption to the urgent work in the performance and aerial mapping section and forwarded to the North Central Division.

Enter in red ink immediately above the entries in columns (1) to (8), inclusive, the date, the hour, and the temperature and relative humidity readings as determined at the time scaling was begun. At the end of the tolerance check report similar entries will be made for the time scaling was completed. In the event it is impossible to complete scaling enlargements for a county by the close of the working day, the date, the hour, and temperature and relative humidity readings as determined at the time scaling was interrupted will be entered below the last enlargement scaled. Similar entries will be made at the time scaling is resumed.

In columns (7) and (8) or in columns (15) and (16) enter the tolerance values directly opposite the scaled dimensions. Such entries will be preceded by a plus or minus sign.

Immediately below the date line on the first page of the report enter the date of mailing, and a member of the state committee will initial the report immediately below the line for signature.

C. Reordering Enlargements.

When an enlargement is reordered because of poor photographic quality or excessive tolerance, the following information will be entered on Form AP-1:

After the words "Order No." in the upper left-hand corner of Form AP-1, enter the next consecutive number for the enlargement orders, and above such number enter the word "Reorder". All other data, excepting those for "Sheet No.", "Date", and "Remarks", will be the same as those appearing above the columns on the original order.

Enter in columns (1) to (6), inclusive, the symbols, roll numbers, negative numbers, the dimension to which 6.6 inches should be enlarged, and the width and length dimensions of each enlargement reordered.

If an enlargement is reordered because of excessive tolerance, enter on the proper line in columns (13) and (14) the scaled dimensions of the enlargement. Enter on the proper lines in columns (15) and (16) the tolerance values for the enlargements with the proper plus or minus signs preceding them.

If an enlargement is reordered because of photographic quality, enter on the appropriate line in columns (9) to (16), inclusive, the reason for rejection.

Form AP-1 will be prepared in quadruplicate for all reorders. The original and two copies will be forwarded to the North Central Division, and one copy retained in the State office. The first page of the original and the first page of the two copies will be signed by a member of the State committee. The date preceding the signature and title will be the date the enlargement order is mailed to the North Central Division.

D. Returning Rejected Enlargements.

All rejected enlargements, as well as those not ordered but received with the shipment, will be returned to the North Central Division immediately, unless used temporarily as a substitute for the reordered enlargements. Symbols, roll and negative numbers of all enlargements returned will be listed on the Form AP-6 accompanying such shipment.

PART XII - USE OF FORM AP-6

Form AP-6 will be used for all shipments of materials and "AP" forms. The instructions on the reverse side will be followed except that when materials are sent by first-class mail all carbon copies will be enclosed with the shipment.

The "remarks" will pertain only to the shipment and will not be initialed nor a letter attached to the AP-6 unless sent first class.

All "AP" forms will be sent first class.